

**WHAT IS CLAIMED IS:**

1. A seal for use in a solid oxide fuel cell comprising a matrix of ceramic fibres and a plurality of solid particles interspersed between the ceramic fibres.
2. The seal of claim 1 wherein the solid particles comprise non-sintered ceramic particles.
3. The seal of claim 1 further comprising a binder material.
4. The seal of claim 1 wherein the fibres are randomly oriented.
5. The seal of claim 1 wherein the seal is compressed prior to use.
6. The seal of claim 2 wherein all or some of the ceramic fibres are selected from the group comprising alumina, zirconia, titania, magnesia or silica.
7. The seal of claim 6 wherein some or all of the ceramic particles are selected from the group comprising alumina, zirconia, titania, magnesia or silica.
8. The seal of claim 1 wherein a substantial portion of the solid particles have a particle size of less than about 1 micron.
9. The seal of claim 8 wherein the solid particles comprises a first portion and second portions wherein the particle size of the first portion is larger than the particle size of the second portion.
10. The seal of claim 9 wherein the first portion has a particle size of about 0.50  $\mu\text{m}$  and the second portion has a particle size of about 0.17  $\mu\text{m}$  or less.

11. The seal of claim 9 wherein the first portion has a particle size of about 0.50  $\mu\text{m}$  and the second portion has a particle size of about 0.06  $\mu\text{m}$  or less.

12. The seal of claim 9 wherein the fibres are alumina and the particles are alumina or zirconia.

13. The seal of claim 3 wherein the fibres are alumina fibres.

14. The seal of claim 6 wherein the particles are alumina or zirconia particles.

15. The seal of claim 1 or 8 wherein the solid particles comprise glass particles.

16. The seal of claim 15 wherein said glass particle soften but do not coalesce at the operating temperature of the SOFC.

17. A flexible gasket seal for use in a solid oxide fuel cell comprising a matrix of randomly oriented ceramic fibres and a plurality of non-sintered ceramic particles interspersed between the ceramic fibres wherein a first portion of the ceramic particles has a particle size larger than a second portion of the ceramic particles.

18. The seal of claim 17 wherein the first portion has a particle size of about 0.50  $\mu\text{m}$  and the second portion has a particle size of about 0.17  $\mu\text{m}$  or less.

19. The seal of claim 18 wherein the second portion has a particle size of about 0.06  $\mu\text{m}$  or less.

20. The seal of claim 17 wherein the fibres comprise alumina fibres and the particles comprise alumina or zirconia particles.

21. A method of forming a gasket seal comprising the steps of:

- (a) providing a matrix of ceramic fibres; and
- (b) interspersing a plurality of solid particles within the fibre matrix.

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22. The method of claim 21 wherein the solid particles are non-sintered ceramic particles or glass particles.

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23. The method of claim 21 or 22 wherein the solid particles are interspersed within the fibre matrix by contacting the fibre matrix with a suspension of the particles in a suitable liquid media and subsequently removing the liquid media.

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24. The method of claim 21 wherein the solid particle suspension comprises a combination of first portion of non-sintered ceramic particles and a second portion of non-sintered ceramic particles wherein ceramic particles of the first portion are larger than ceramic particles of the second portion.

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25. The method of claim 17 wherein the seal is compressed subsequent to interspersing the particles within the fibre matrix.

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26. A method of forming a flexible ceramic seal comprising the steps of:

- (a) providing a matrix of ceramic fibres; and
- (b) interspersing a plurality of ceramic particles within the fibre matrix by contacting the fibre matrix with a suspension of the ceramic particles in a suitable liquid media and subsequently removing the liquid media, wherein said ceramic particles comprise a first portion of particles having a diameter of about 0.50  $\mu\text{m}$  and a second portion of particles having a diameter of about 0.06  $\mu\text{m}$  or less.

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